

Amendment Under 37 CFR § 1.111
January 25, 2002

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REMARKS

Claims 1, 7, 10-22 and 24 are pending in this application.

Non-elected claims 2-6, 8-9 and 23-29 have been canceled without disclaimer or prejudice of the subject matter thereon. New claims 33-37 have been added.

Approval and entry of this amendment are respectfully requested.

In the Abstract:

The Abstract has been objected to because it is more than one paragraph in length. In accordance with MPEP § 608.01(b), a Substitute Abstract has been filed with this Amendment to overcome this objection.

Claim Objections:

Claims 10-12 and 21 stand objected to under 37 CFR 1.75(c) as being in improper form because multiple dependent claims cannot depend upon any other multiple dependent claims.

We have amended claims 10-12 and 21 to correct this informality.

Rejections Under 35 U.S.C. §102:

Claims 1, 13-14 and 16-19 have been rejected under 35 U.S.C. 102(e) as being anticipated by Japanese Patent 11-62,879 (Figures 1-2).

Independent claims 1 and 16 are believed to be fully supported by the earliest priority applications, *i.e.* JP9-187681 (filed on June 27, 1998) and JP10-29160 (filed on January 27, 1998), and hence the rejections of claims 1 and 16 based on JP11-62879, U.S. 2001/0016160 and **Stone**

(USP 6,135,709) are effectively overcome by submission of verified translations of JP9-187681 and JP10-29160.

Claims 1, 13-15, 16-19, and 31-32 are rejected under 35 U.S.C. 102(b) as being anticipated by Japanese Patent 61-25,994 (figure 1).

In rejecting the claimed invention, the outstanding Office Action has specifically stated that:

" Note the turbomolecular pump having stator 11 surrounding rotor 13, the casing 27, with a clearance being formed between the stator and casing so that when abnormal torque is applied from the rotor to the stator, direct impact transmission is prevented from the stator to the rotor. Note impact absorbing member 27 between the stator and casing, with the stator having a multiple structure comprising stator vanes 16. The impact absorbing member also functions as a temperature adjusting mechanism that cools the stator. The stator and rotor comprise a vane pumping section, and the impact absorbing structure comprises an inner casing surrounding the vane pumping section, with the inner casing being fixed by fitting part of an inner surface of the inner casing to a cylindrical portion of the stator."

Therefore, the Office has variously interpreted reference numeral **27** as a casing, and an impact absorbing member, wherein the "impact absorbing member also functions as a temperature adjusting mechanism that cools the stator", and " the impact absorbing structure comprises an inner casing surrounding the vane pumping section, with the inner casing being fixed by fitting part of an inner surface of the inner casing to a cylindrical portion of the stator."

However, Japanese reference 61-25994 merely discloses reference numeral **27** as a vessel without any regard of being an impact absorbing member and without any of the attributes the Office recites to be associated with the impact absorbing member.

Japanese Patent Publication No. 61-25994 discloses a turbo-molecular pump in which spacers 24 for supporting stator vanes 16 are provided below a casing having an intake port 17 in

a multistage piled manner and fixed to the casing. Therefore, an abnormal torque caused by an abnormal condition of the rotor such as breakage of the rotor is directly transmitted to the casing through the stator vanes 16, the spacers 24, and the fixing portions of the casing where the uppermost spacer and the lowermost spacer are fixed, respectively. Further, the vessel 27 is located outside the spacers 24, *i.e.*, the vessel 27 is located outside the location where the spacers 24 are fixed to the casing. Therefore, the vessel 27 is not proved in the torque transmitting path which allows an abnormal torque to be transmitted from the stator to the casing, and hence such abnormal torque is directly transmitted from the stator to the casing.

In contrast thereto, in claims 1 and 16, at least a partial clearance is formed between the stator assembly and the pump casing (claim 1) or the impact absorbing structure is provided in at least a part of the stator (claim 16) so that even if the rotor is broken, direct impact transmission from the stator to the pump casing can be prevented to avoid damaging the pump casing.

Therefore, independent claims 1 and 16 patentable distinguish the applied prior art. All claims dependent thereon, by virtue of the inherence, also patentable distinguish the applied prior art. Reconsideration and withdrawal of this rejection are respectfully requested.

Claims 16-19 and 31-32 are rejected under 35 U.S.C. 102(b) as being anticipated by Japanese Patent 57-212,395 (figure 2).

In rejecting the claimed invention, the Office has stated in its entirety that:

"Note the turbomolecular pump having stator 3 surrounding rotor 2, the casing 4, vane pumping section near 3, and impact absorbing structure 15. The impact absorbing structure comprises an inner casing surrounding the vane pumping section. A clearance is provided between the inner casing and the casing portion. The impact absorbing member also functions

as a temperature adjusting mechanism that cools the stator."

The Office interprets reference numeral **15** as an impact absorbing structure with attributes of comprising "an inner casing surrounding the vane pumping section. A clearance is provided between the inner casing and the casing portion. The impact absorbing member also functions as a temperature adjusting mechanism that cools the stator."

However, Japanese reference 57-212395 merely discloses reference numeral **15** as a jacket.

Japanese Patent Publication No. 57-212395 discloses a molecular pump in which rotating blades 1 are provided on a rotor 2, and stator blades 3 are fixed to an inner casing 11. The inner casing 11 is disposed inside of a casing 4. This inner casing 11 is movably supported by support flanges 12, 13 and is urged downwardly against an inwardly projecting flange of the casing 4 by a pressing spring 14.

A jacked 15 for allowing cooling medium to pass therethrough is provided outwardly of the inner casing 11. This jacket 15 has an introduction pipe 16 for introducing the cooling medium. Since the inner casing 11 is fixed to the inwardly projecting flange of the casing 4 and the support flanges 12, 13, if the rotor 2 is broken, the impact force generated when broken pieces are collided with the stator blades 3 and fixing members for fixing the stator blade 3 is transmitted to the casing 4 directly.

In contrast thereto, in claim 16, the impact absorbing structure is provided in at least a part of the stator so that even if the rotor is broken, direct impact transmission from the stator to the pump casing can be prevented to avoid damaging the pump casing. Thus, the present invention is difference from JP57-212395.

Therefore, independent claim 16 patentable distinguishes the applied prior art. All claims dependent thereon, by virtue of inherence, also patentable distinguish the applied prior art. Reconsideration and withdrawal of this rejection are respectfully requested.

Claims 16-19 are rejected under 35 U.S.C. 102(e) as being anticipated by **Stones** (figure 3).

Independent claim 16 has been amended to include a feature that “when an abnormal torque is applied from said rotor to said stator assembly, direct impact transmission is prevented from said stator assembly to said casing portion. This feature is not disclosed or suggested by **Stone**.

Therefore, independent claim 16 patentable distinguishes the applied prior art. All claims dependent thereon, by virtue of the inherence, also patentable distinguish the applied prior art. Reconsideration and withdrawal of this rejection are respectfully requested.

Claims 1, 7, 13-14, 16-17, 19, 20/17, 20/19, and 30 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent Application Publication U.S. 2001/0016160 A1.

Independent claims 1 and 16 are believed to be fully supported by the earliest priority applications, *i.e.* JP9-187681 (filed on June 27, 1998) and JP10-29160 (filed on January 27, 1998), and hence the rejections of claims 1 and 16 based on JP11-62879, U.S. 2001/0016160 and **Stone** (USP 6,135,709) are effectively overcome by submission of verified translations of JP9-187681 and JP10-29160.

Rejection Under 35 U.S.C. § 103:

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over either (Japanese Patent 61-25,994 or 57-212,395) in view of **Miki**.

Claim 20/18 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Application Publication U.S. 2001/0016160 in view of Japanese Patent 11-62,879.

Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over either (Japanese Patent 61-25,994 or 57-212,395 or **Stones**) in view of **Schutz**.

Since all of these claims are dependent upon various rejections which we have overcome by either claim amendment or submission of the earliest priority application, by virtue of inherency, these rejections are moot.

CONCLUSION

In view of the aforementioned amendments and accompanying remarks, all pending claims are believed to be in condition for allowance. There being no other objections or rejections, allowance of the present invention is respectfully requested.

If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact Applicant's undersigned attorney at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

In the event that this paper is not timely filed, Applicant respectfully petitions for an appropriate extension of time. The fees for such an extension or any other fees which may be due with respect to this paper, may be charged to Deposit Account No. 01-2340.

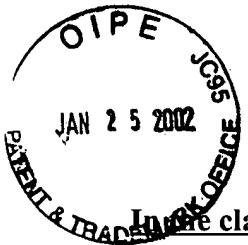
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Enclosures: Version with Markings to Show Changes Made
Substitute Abstract



VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the claims:

The claims have been amended as follows:

10. **(Amended)** A turbo-molecular pump according to ~~any of claims 1 to 9~~ claim 1, further comprising a slide facilitating member for facilitating said stator assembly to slide in a circumferential direction relative to said casing portion.

16. **(Amended)** A turbo-molecular pump comprising:
a casing portion housing a stator and a rotor therein; and
a vane pumping section and/or a groove pumping section comprised by said stator and said rotor;

wherein an impact absorbing structure is provided in at least a part of said stator, so that, when an abnormal torque is applied from said rotor to said stator assembly, direct impact transmission is prevented from said stator, assembly to said casing portion.

21. **(Amended)** A turbo-molecular pump according to ~~any of claims 17 to 20~~ claim 17, wherein said impact absorbing structure comprises an impact absorbing member provided between said stator in said vane pumping section and/or groove pumping section and said inner casing.